

REMARKS

Claims 4-12, 15, 20-31, 36, 38-40 and 52-58 are pending. Claims 1-3, 13, 14, 16-19, 31-35, 37 and 41-51 have been canceled without prejudice.

Support for the amendment to claims 4-8 can be found in canceled claims 16-18.

Support for the amendment to claims 20-24 can be found in canceled claims 32-34.

Process claims 53-57 have been withdrawn from consideration as being drawn to nonelected subject matter.

No new matter has been added by way of the above-amendment.

I. Prior Art Based Issues

The following prior art based Rejections are pending:

(A) Claims 4-12, 15-18, 20-34, 36, 38-40, 52 and 58 are rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 974 617 ("EP '617") in view of EP 976 782. Yorita et al. (US 6,303,666) ("Yorita") is relied on as an equivalent form of EP 976 782; and

(B) Claims 4-12, 15-18, 20-34, 36, 38-40, 52 and 58 are rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 1 095 764 in view of EP 976 782. Kobayashi et al. (US 6,589,664) and Yorita et al. (US 6,303,666) are relied on as an equivalent form of EP 1 095 764 and EP 976 782 respectively.

Applicants respectfully traverse both Rejection (A) and Rejection (B).

IA. Advantages of the present invention:

In the conventional process for producing foamed articles containing an elastomer (vulcanized rubber), the components of a vulcanizing agent and a foaming agent are first admixed with natural rubber or a synthetic rubber and then are kneaded. The resulting kneaded mass is formed into a contemplated shape, followed by heating to effect vulcanization and foaming to obtain a foamed article of the elastomer. In this conventional process, it is necessary to perform a preliminary process step of kneading a composite blend together with the rubber to obtain a kneaded mass and to carry out thereafter a process step of forming the kneaded mass

into the form of a ribbon so as to facilitate the ease in which the kneaded mass can be fed into the extruding machine before the continuous kneading. Lastly, the rubber is formed into a predetermined shape by continuous extrusion.

This prior technique is disadvantageous for industrial production, since the process steps are intricate and, in addition, considerable time is required for both the process steps of vulcanization and of foaming.

As a technique for solving such problems, there is a method of using, for example, a thermoplastic resin, such as an ethylene/vinyl acetate copolymer, low density polyethylene or so on, or a partially cross linked thermoplastic elastomer constituted of an olefinic copolymer rubber and an olefinic resin. According to this method, the process steps mentioned above can be dispensed with.

However, conventional thermoplastic resins and thermoplastic elastomers have a problem in that they may have an inferior appearance resulting from the tendency of defoaming to occur when the foamed composition is molded. Also, conventional thermoplastic resins and thermoplastic elastomers have a problem in that the foaming expansion ratio of the foamed article is lower, usually only to about 1.5 times, thereby resulting in an article which is harder to the (hand) touch.

Further, when a part formed from these techniques with a conventional foamed body is subjected to repeated sliding or contact, such as a weather strip or a sealing element on a window sash for an automobile, it may be difficult for it to be used as a sliding element or the like due to its inferior durability resulting from its poor resistance to abrasion and lower sliding performance.

On the contrary, in the foamed laminate based on the olefins according to the present invention, it is important to adopt the combination of a foamed substrate layer comprising a foamed body composed of an ethylenic thermoplastic elastomer having a specific composition, characteristic and greater expansion ratio of at least twofold and an unfoamed skin layer comprising a specific resin or elastomer composition, and further the foamed laminate is a co-extruded product formed by co-extrusion in which foaming and heat fusion occur simultaneously. In the present invention, the foamed body of the substrate layer is formed by

subjecting a foamable ethylenic thermoplastic elastomer composition to foaming. This foamable ethylenic thermoplastic elastomer composition comprises an uncrosslinked ethylenic thermoplastic elastomer comprising a polyethylene resin, a copolymer based on ethylene/ α -olefin and an organic or inorganic foaming agent of a heat decomposition type.

Co-extrusion is a common technique to form a multilayer composite composed of multiple layers of solid resins or elastomers. In the past, however, co-extrusion has not been applicable in the formation of a multilayer composite comprising foamed layers because co-extrusion degases the foamed layers minimizing the expansion ratio and obstructing the formation of uniform foamed layers having superior quality and appearance.

The present invention provides a foamed laminate based on olefins which comprises an olefinic polymer, wherein the olefinic polymer can be recycled and wherein a high foaming expansion ratio can be obtained. Thus, the inventive foamed laminate exhibits a soft hand touch and is superior in: a) appearance, b) resistance to abrasion, c) durability and c) sliding performance. In particular, the inventive foamed laminate is superior in the resistance to abrasion under difficult conditions.

According to the present invention, degasification during co-extrusion can be prevented and the foamed body (X_{F1}) having a foaming expansion ratio of at least twofold can be obtained by adopting the specific uncrosslinked ethylenic thermoplastic elastomer (A) which comprises of a polyethylene resin (comprising little co-monomer) (a-1) and an ethylene/ α -olefin copolymer (comprising a lot of co-monomer) (a-2) and having a specific compression set of 60 % or less and a melt flow rate of 0.1 g/10 min. or higher. The ethylenic thermoplastic elastomer (A) having superior elasticity confines generated foams in the substrate layer in a high density and in a uniform state and forms the multilayer composite by heat fusion with the skin layer maintaining such a state.

In order to form the substrate layer composed of a foamed body having a high expansion ratio, incorporation of the specific components with the specific characteristics (especially a compression set of the ethylenic thermoplastic elastomer (A)) is important whereby the foamed body having a high expansion ratio of at least twofold is obtained and the foamed laminate is formed by heat fusion.

The inventive foamed laminate and its advantageous properties are neither taught nor fairly suggested by the cited references. Applicants now discuss the teachings of the references cited in Rejection (A).

IB. Rejection (A)

EP '617 teaches a resin composition suitable for use as a skin member similar to the skin layer of the present invention. EP '617 suggests a laminate comprising the above skin member laminated to a core comprising a thermoplastic elastomer. However, EP '617 fails to teach or suggest a substrate layer having a foamed body as presently claimed.

The Examiner, aware of the deficiencies in EP '617, cites Yorita to cure those deficiencies. However, Applicants respectfully submit that Yorita fails to cure the deficiencies of EP '617.

The Examiner points out that Yorita teaches an expanded olefinic thermoplastic elastomer product having the foaming expansion ratio of at least 2 times. However, Yorita is silent with respect to: i) the co-extruded multilayer lamination of the foamed substrate layer and the unfoamed skin layer; and ii) the organic or inorganic foaming agent of a heat decomposition type.

Yorita teaches an expanded olefinic thermoplastic elastomer product of a mono-layer foamed by super critical carbon dioxide. Even assuming *arguendo* that it is possible to obtain an expanded olefinic thermoplastic elastomer product of a mono layer having the foaming expansion ratio of at least 2 times with super critical carbon dioxide, it is NOT possible to foam up only the substrate layer by super critical carbon dioxide in the co-extrusion of the foamed substrate layer and the unfoamed skin layer because the super critical carbon dioxide would permeate and foam both layers.

On the contrary, in the present invention, a foamed laminate composed of the foamed substrate layer having the foaming expansion ratio of at least 2 times and the unfoamed skin layer can be formed easily by co-extrusion. The foamed laminate is a co-extruded product in which the substrate layer and the skin layer are heat fused and the

substrate layer is foamed by co-extrusion by multilayer extrusion molding machine.

This becomes possible with the inventive process, wherein the foamed body is formed by subjecting a foamable ethylenic thermoplastic elastomer composition comprising the ethylenic thermoplastic elastomer and 0.5 - 20 parts by weight of an organic or inorganic foaming agent of a heat decomposition type per 100 parts by weight of the ethylenic thermoplastic elastomer (A) and the foaming agent to foaming by co-extrusion with the foaming expansion ratio of the foamed body of at least twofold, wherein the foamed laminate is formed by co-extrusion of the foamable ethylenic thermoplastic elastomer composition and the ultrahigh molecular weight polyolefin resin wherein the foamable ethylenic thermoplastic elastomer composition foams by heat fusing to form the substrate layer of the foamed body.

Based on the amended claims, Applicants respectfully submit that the cited references do not amount to a *prima facie* case of obviousness. To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Additionally, there must be a reason why one of ordinary skill in the art would modify the reference or combine reference teachings to obtain the invention. A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art. *KSR Int'l Co. v Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007). There must be a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does. Here, there is no rational reason for one skilled in the art to modify the cited references to obtain that which is presently claimed. Reconsideration and withdrawal of Rejection (A) is respectfully requested.

IC. Rejection (B):

With respect to Rejection (B), it appears that the Examiner has not taken into consideration Applicants' supplemental response which was filed June 23, 2008 wherein Applicants provided verified English translations of the instant priority documents JP 2000-203088 and JP 2000-203089. Upon review of the PTO website, Applicants see that the June 23, 2008 submission has been scanned by the PTO and is available for the Examiner's review.

As such, the Examiner is respectfully requested to consider Applicants' June 23, 2008 submission and withdraw Rejection (B).

II. Double Patenting

Claims 4-12, 15-18, 20-34, 36, 38-40, 52 and 58 are rejected on the grounds of non statutory obviousness-type double patenting as being unpatentable over claims 1-13 of US Patent No. 6,589,664 in view of Yorita et al. (US 6,303,666). Applicants respectfully traverse the rejection.

Applicants respectfully submit that the above-amendment to the independent claims has further distinguished the present invention from the invention claimed in US Patent No. 6,589,664 to an extent that Yorita does not cure the deficiencies of the claims of US Patent No. 6,589,664. As such, reconsideration and withdrawal of the rejection are respectfully requested.

In view of the above amendment, Applicants believe the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Garth M. Dahlen, Ph.D., Esq. Reg. No. 43,575 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.


Application No. 10/069,603
Amendment dated January 6, 2009
Reply to Office Action of July 7, 2008

Docket No.: 0992-0128P

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

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